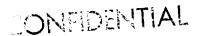
Approved For Release 2008/09/18 : CIA-RDP90B01370R000500740007-9 OLL 84-0139 CENTRAL INTELLIGENCE AGENCY Office of Legislative Liaison Washington, D. C. 20505 STAT Telephone: RECORD COPY Mr. Scott Ulm, Majority Staff TO: Committee on Governmental Affairs United States Senate Scott: The attached memo was prepared in response to a question you raised at the briefing on 2 December 1983. Please note the Confidential classification. **STAT**

FORM 1533 OBSOLETE PREVIOUS EDITIONS.

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14 December 1983

MEMORANDUM FOR THE RECORD

SUBJECT: The Use of Low Enriched Uranium (LEU) in Heavy Water Moderated Reactors

1. The majority of heavy water reactors including the Candu type are fueled with natural uranium oxide. However, several heavy water reactors use low enriched uranium (LEU) as fuel instead of natural (unenriched) uranium. Studies were conducted by Canada in the late 1950's regarding the use of either uranium metal or uranium oxide fuel with uranium enrichment levels ranging from natural uranium to 1.16 percent uranium-235. The studies showed that lower costs could result for systems using enriched uranium, depending on the relative costs of natural and enriched uranium. A much higher level of irradiation, however, must be achieved for any saving. addition, using slightly enriched metal fuel resulted in lower costs than slightly enriched uranium oxide. However, the stability of enriched uranium oxide fuel under irradiation is greater than that or uranium metal. Therefore, a higher revel of irradiation can be achieved leading to increased burn-up levels using highly enriched uranium oxide. But slightly enriched uranium fuel in heavy water reactors must remain in the reactor core for a longer period of time in order to economically optimize the use of uranium-235. The time is often beyond the physical capability of the fuel to withstand a nuclear reactor core environment such as high temperature and pressure. This limitation, however, may no longer exist because of advances in nuclear fuel development.

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